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| 10/682,043      | 10/09/2003  | Kari Kirjavainen     | 29385/39667         | 8156             |

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| EXAMINER |
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BRINEY III, WALTER F

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| ART UNIT | PAPER NUMBER |
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2615

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE  | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS                               | 03/20/2007 | PAPER         |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/682,043

Applicant(s)

KIRJAVAINEN, KARI

Examiner

Walter F. Briney III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2007 and 27 October 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-18 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14, 16-18 and 20-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 27 October 2006 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Brettell (US Patent 3,136,867).**

**Claim 1** is limited to "an electromechanical transducer." Figures 2, 3 and 7 of Brettell clearly depict "two transducer elements" 46-48 that are "separately controlled" by the signals from inductive delay line 131 seen in figure 7, which corresponds to "controlling means for separately controlling the transducer elements such that the center of mass of the transducer is moved and/or a signal is generated from the movement of the center of mass." Each transducer has "two layers," including

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diaphragm 52 and plate 43. In addition, each transducer has an air layer in between the diaphragm and plate, as best seen in figure 3. The diaphragm moves in response to an exciting signal, which causes a change in thickness of the air layer. As seen in figure 2, the plate 43 has holes 55, which "allow air to flow inside the transducer element in the direction of thickness thereof." See column 2, lines 68-72; column 3, lines 1-22; and column 6, lines 43-68. Therefore, Brettell anticipates all limitations of the claim.

**Claim 4** is limited to "a transducer as claimed in claim 1," as covered by Brettell. The "two transducer elements" 46 and 48, for example, have diaphragm 52 in between, which is "an air impermeable layer." Therefore, Brettell anticipates all limitations of the claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 2, 5, 6, 9-14, 17, 18, 20 and 23-25 are rejected under 35 U.S.C. 102(b) as being unpatentable over Bolleman et al. (US Patent 5,682,075) in view of Brettell.**

**Claim 1** is limited to "an electromechanical transducer." This claim has been amended to recite "at least two separately controlled transducer elements" versus "two separately controllable transducer elements." It is noted that Bolleman's transducer

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elements 21-24 are each separately controllable, however, none are separately controlled. This deficiency, however, is overcome by an obvious modification.

In particular, it is known in the art, such as the disclosure of Brettell, to electrically delay driving signals destined for stacked transducer elements so that a proper phase relationship is maintained, especially at higher frequencies. See Brettell—column 6, lines 43-68. In figure 7 of Brettell, each transducer 121-127 is “separately controlled” by a signal from the delay line formed of inductors 131.

It would have been obvious to one of ordinary skill in the art at the time of the invention to separately control each of Bolleman’s transducers 21-24 using an inductive delay line as taught by Brettell for the purpose of overcoming the wave delay phenomenon associated with stacked transducer arrays, thereby preserving proper phase relationships for reproduced signals, especially at higher frequencies.

**Claims 2, 5, 6 and 12-14** are limited in part to “a transducer as claimed in claim 1,” as covered by Bolleman in view of Brettell, while **claims 17, 18 and 20** are limited to “a method for transforming energies from mechanical energy into electrical energy and/or vice versa.” These claims are rejected for the above reasons regarding claim 1 as well as the respective reasons set forth in the Non-Final Rejection filed 28 February 2006.

**Claims 9-11** are limited in part to “a transducer as claimed in claim 1,” as covered by Bolleman, while **claims 23-25** are limited in part to “a method for transforming energies from mechanical energy into electrical energy and/or vice versa.”

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These claims are rejected for the above reasons regarding claim 1 as well as the respective reasons set forth in the Non-Final Rejection filed 28 February 2006.

3. Claims 7, 8, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolleman in view of Brettell and further in view of Kirjavainen (US Patent 4,654,546).

Claims 7 and 8 are limited in part to "a transducer as claimed in claim 1," as covered by Bolleman, while claims 21 and 22 are limited in part to "a method for transforming energies from mechanical energy into electrical energy and/or vice versa." These claims are rejected for the above reasons regarding claim 1 as well as the respective reasons set forth in the Non-Final Rejection filed 28 February 2006.

4. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Brettell in view of Tamura et al. (US Patent 3,894,199).

Claim 16 is limited to "a transducer as claimed in claim 1," as covered by Brettell. However, Brettell does not disclose "a porous layer whose surface is provided with an electret layer such that the electret layer is constructed of separate points, zones or stripes of an electret material." This deficiency is overcome by an obvious modification.

Notice is taken of Tamura. Tamura depicts a prior art electrostatic transducer making use of two fixed electrodes 12 and a conductive diaphragm 13 that is biased using source  $E_o$  and resistor  $R_o$ . Tamura teaches that such an arrangement has several problems. See column 1, lines 11-25. The similarity between said prior art figure 1 and figure 1 of Brettell reveals several problems with Brettell's design that can be compensated by applying the teachings of Tamura. See column 2, lines 25-31. In

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particular, figure 2 of Tamura depicts each element comprising "a porous layer" 211 and 221 with an electret 212 and 222 formed at "separate points" on the porous layer. See column 1, lines 62-66.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the conductive diaphragm of Brettell with a non-conductive diaphragm biased by electrets as taught by Tamura for the purpose of simpler construction and the elimination of a polarization source 31.

### ***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

5. Claim 15 is allowed.

**Claim 15** is limited to "an electromechanical transducer." This claim has been rewritten in independent form, thereby obviating the objection filed 25 July 2006 to being allowable while dependent on a rejected parent claim. Thus, claim 15 is allowable over the cited prior art.

### ***Response to Arguments***

Applicant's arguments filed 27 October 2006 have been fully considered but they are not persuasive.

**With respect to claim 1**, the applicant alleges on page 7, lines 14-21, of the instant response that it would not have been obvious to one of ordinary skill in the art to

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separately control the transducer elements of Bolleman; the examiner respectfully disagrees. The new rejection of claim 1 over Bolleman in view of Brettell provides explicit reasons why one would want to control stacked transducer elements separately. This renders applicant's position one of mere speculation.

The applicant alleges that the other claims not treated above are allowable over the cited prior art for at least the same reasons. However, as all of the applicant's argument have been shown to be either moot or unpersuasive, the rejections of claims 1, 2, 4-14, 16-18 and 20-25 are maintained.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

wfb  
3/15/07

  
**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**